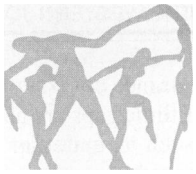
Women and Medicine



A Forecast of Women's Health and Longevity
Implications for an Aging America

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Our society has witnessed an unprecedented and unanticipated increase in life expectancy in the 20th century. Over the past 15 years, mortality rates have declined at a rapid rate among those older than 65 years. The drop in mortality from 1965 onward followed two decades of virtually stationary death rates for men and slowly declining ones for women, a drop that caused worrisome inaccuracies in social programs that rely on projections, such as Social Security. Because of this dramatic change—"a demographic transition"—new and more accurate data on longevity and health are becoming available.[1] Analysts are trying to develop models to better forecast the population patterns of the next 30 to 50 years. These forecasts will have major implications for planning health care services, health care financing policies, and priorities for research.

In this article, we will review the current data on longevity of women. We will describe the status of health in old age by examining national data on morbidity and, equally important, on disability. We will look at changes in women's roles that are related to health status and, finally, review some special issues for disease prevention that are relevant to women.

Life Expectancy and Mortality

Since population records have been kept, a century or more, the life expectancy of women has always exceeded that of men. Even though some recent statistics indicate that the longevity gap is narrowing somewhat,[2] there is no reason to think it will close altogether. In 1900, a man who reached the age of 65 could expect to live 11 more years, and a woman aged 65 could expect to live 12 more years. By 1985, men turning 65 could expect to live 14.5 more years and women turning 65 could expect to live 18.7 more years. The biologic or environmental reasons for this differential life expectancy have yet to be elucidated by scientists, even though this subject has created a great deal of scientific interest, particularly among those concerned with understanding the basic mechanisms of aging and its regulation.

At birth, every cohort has a small excess of male children, but because of a higher death rate for males all across the life span, women far outnumber men in the older age groups. In 1986, for all those 65 and older as a group, the ratio was 68 men to 100 women.[3] The sex ratio declines rapidly with increasing age, as shown in Figure 1.

The group older than 85 years, called the "oldest old," is probably the most important for health care planners and other social policymakers because of steep increases in the prevalence of chronic illness, disability, and dependency in this group. This is not a small group, currently numbering 2 million and growing at a faster rate than any other segment of the population. By the year 2020, there may be as many as 5 million persons older than 85 years. The US Census Bureau's recent publication, *The Centenarians,*[4] points out that the number of persons older than 100 years in the United States increased in just five years from 15,000 in the year 1980 to 25,000 in 1985. The forecast is that this number will increase to 110,000 by the year 2000 and perhaps 300,000 to 500,000 by the year 2050. If these predictions are correct, and if patterns from the past continue, as many as 80% of these centenarians will be women.

Our aging society is not only growing older but becoming increasingly heterogeneous. In successive subgroups older than 65, the general pattern of social characteristics is similar, but the pattern becomes more pronounced. The oldest persons are socially and economically diverse; yet, as a group they have a disproportionately high number of low-income persons, especially women, many of whom are living with someone other than a spouse or by themselves, with a large proportion living in institutional settings.

The longevity differential results in an increasing risk of widowhood among elderly women, leaving them with meager financial resources. The current cohort of women older than 65 receives very little in Social Security or pension benefits because few of them worked outside the home. The result is that while the incomes of both oldest men and oldest women subgroups are lowest, women are more likely to be below the poverty level, especially among minorities.

Not only are most women widowed by the time they reach 65, but by the time they reach 75, more than half live alone. The differences between men and women are dramatic with regard to living arrangements. In 1980, 74% of older men but only 36% of older women had a spouse in the household. At age 75 and older, it was 65% of men but only 19% of women.

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Poor women of advanced old age who live alone are at the greatest risk of being confined to an institution. This is reflected in the fact that of the 1.5 million residents of nursing homes, the average age is older than 80 years and more than two thirds are women.

Active Life Expectancy

Even though elderly women as a group are at great risk of economic and social disadvantage, most of them (and most men) are enjoying good health and good levels of functioning further into old age than was true of persons in earlier decades. Most people today look forward to an active and vital old age; it is disability and dependency they dread and that pose the most pressing demands for medical and long-term care.

The big question facing demographers and epidemiologists is whether the gains in healthy life expectancy are greater than the gains in overall life expectancy. That is, how much of our added years of life can we expect to be relatively healthy and independent? One important study done in Massachusetts[5] found that with increasing age, there was a smaller percentage of "active life expectancy" and a greater percentage of time spent in a state of chronic illness, disability, and dependency (Figure 2).[6] In this study, women had the longer life expectancy in each age group but they had only a modest advantage over men in "active" life expectancy in the 65- to 69-years age group and no advantage in the older age groups. According to the data, while women live longer, the age that disability begins is the same as for men and thus the period of predeath morbidity is increased for women.

Other analysts predict a "compression of morbidity," where life expectancy will reach a maximum around age 85 or 90, with disabling chronic illness prevented or delayed, thus shortening the period of time spent in dependency.[7] This latter model is highly speculative and does not explain observed sex differences.

To evaluate these two contradictory models and to understand their implications for women's health require a look at the specific causes of death and of disability in women.

Causes of Mortality

The three leading causes of death—heart disease, cancer, and stroke—account for about 75% of all deaths in people older than 65 years and are about the same for men and women. For all three causes of death, progress in prevention, as well as in diagnosis and treatment, has delayed both the onset of the disease and death from the disease. Deaths from cardiac disease, cancer, or stroke have not been entirely prevented, but they happen much later in life than they did 20 or even 10 years ago. In the oldest, the over-85 group, both men and women die more frequently of stroke than of malignant disorders, while cardiovascular disease remains the number one cause of death. Progress in risk factor modification and in the treatment of these diseases will continue to increase life expectancy, but it is not likely that the major causes of death will change much in the next 20 years.

Morbidity and Mortality

Figure 3 contains survival curves representing mortality, disability, and morbidity. The outermost curve (mortality) shows the progressive number of persons dying as a cohort ages. The lowest curve (morbidity) represents the probability of surviving to a given age free of chronic disease. The area labeled A under this curve represents the number of years that a person in this cohort could expect to survive free of disease. Morbidity refers to the presence of disease but does not imply anything about the impact of disease on a person's functional level or quality of life.

Morbidity statistics have been taken from national surveys and other sources in which disease categories, either self-reported by patients and their families or taken from medical records, indicate the prevalence of certain kinds of diseases.

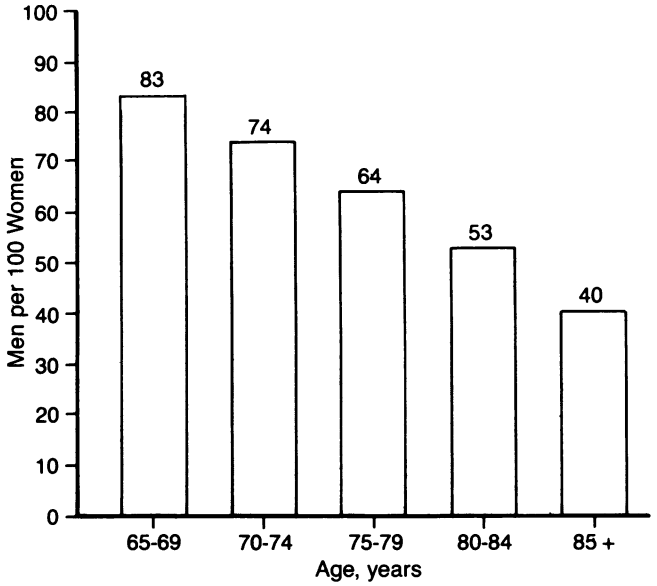

Figure 1.—The graph shows the number of men per 100 women by elderly age group in 1986 (from US Bureau of the Census[3]).

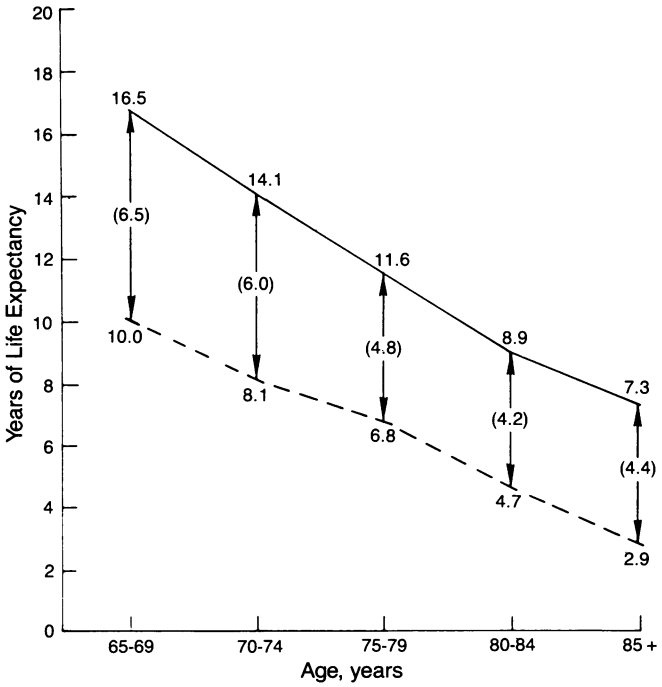

Figure 2.—The graph shows the average years of active life expectancy between 1974 and 1976 **(dashed line)** in relation to life expectancy in 1974 **(solid line)**. The numbers in parentheses indicate the average number of years for each group spent in a state of chronic illness, disability, and dependency (from Statistics for Health Policy[6]).

The most commonly reported illnesses among women, as well as among men, are chronic, predominantly nonfatal diseases. In national surveys of the population older than 65 in an institution, arthritis is the most frequently reported chronic condition (50%), with hypertension (40%), hearing impairment (30%), and visual impairment (10%) also listed as significant contributors to morbidity.[8]

Disability

Returning to Figure 3, the middle curve labeled disability shows the probability of surviving to a given age free of serious chronic disability. The implication is that morbidity—that is, the presence of disease—can exist without significantly impairing a person's functional level. At some point a person's activities are limited to such a degree that that person thinks of herself or himself as disabled. It is assumed that disability emerges as the result or the progression of some underlying disease processes, but social, economic, and psychological factors inevitably influence the degree to which a person is disabled by disease, and it is therefore important to keep such factors in mind.

There are two additional areas in Figure 3. The first, the area between the morbidity and disability survival curves labeled B, defines the number of years that a person can expect to live with the presence of disease but free from disability. The second area defined by the disability curve, labeled C and lying between the disability curve and the mortality curve, represents the number of years that a person can expect to live in a chronically disabled state. Thus, the total area under the disability curve (areas A and B) represents the period of "active life expectancy." The period represented between curves B and C is that of disabled or dependent life expectancy. Certain disease processes that do not cause death but do cause functional impairment will be most significant during this period, such as Alzheimer's disease, Parkinson's disease, arthritis, visual or hearing impairments, and fractures due to osteoporosis, especially of the hip and vertebrae. Obviously, the existence and duration of these kinds of disabilities will have an important impact on the need for long-term care services.

Disability is usually measured by the number of days disabled, degree of activity limitation due to chronic conditions, or self-rated health status. In some studies of the elderly, measures of functional state such as the ability to perform activities of daily living—those related to basic hygiene, feeding, and mobility—are used. A somewhat different but related measure is of "instrumental" activities of daily living in which higher levels of function, including such things as shopping, cleaning, and managing finances, are tallied.

Some of these instrumental activities traditionally have been carried out by women and, thus, when a man becomes disabled, he can go on living "independently" if his wife does the shopping and cleaning and cooking.[9] For a woman, particularly a woman living alone, a stroke that impairs her ability to shop or clean can make an enormous difference in her ability to go on living independently. Thus, there is role bias in a number of studies of disability. Because the measures used in such studies were not differentiated for men and women, disability rates for men may be understated.

Using disability measures, can we detect a trend in the health of older American women in the past few decades? Studies of trends for both American men and women[10] have found that health profiles have worsened at all ages, especially in the group older than 65. Policy analysts attribute this phenomenon to a combination of better treatment of acute illness that allows more people to survive with disability and the fact that more recent studies have provided more extensive data. For the United States population at large, national surveys show increased short-term disability rates for both acute and chronic conditions, longer restrictions per acute condition, rising percentages of persons with chronic activity limitation, higher prevalence rates for chronic diseases that are the leading causes of death, and higher prevalence rates for common nonfatal chronic diseases.

The fact that health profiles have worsened has an especially great impact in the elderly population, where lower mortality rates since the 1960s have been documented and where, as a result, there is a longer period of survival during which time people are at risk for a number of the chronic disabling disorders of old age. In addition, an earlier diagnosis of chronic disease and a greater willingness to acknowledge disability may contribute to the reports of an increased prevalence of short- and long-term disability. All of these factors together can be responsible for the increasing morbidity rates.

Women's Roles and Health Status

Tomorrow's elderly will include many of today's working women. In a recent study of the relationships between women's social roles and health status for the period from the mid-1960s to the late 1970s, three major social roles were examined: employment, marriage, and parenthood.[11]

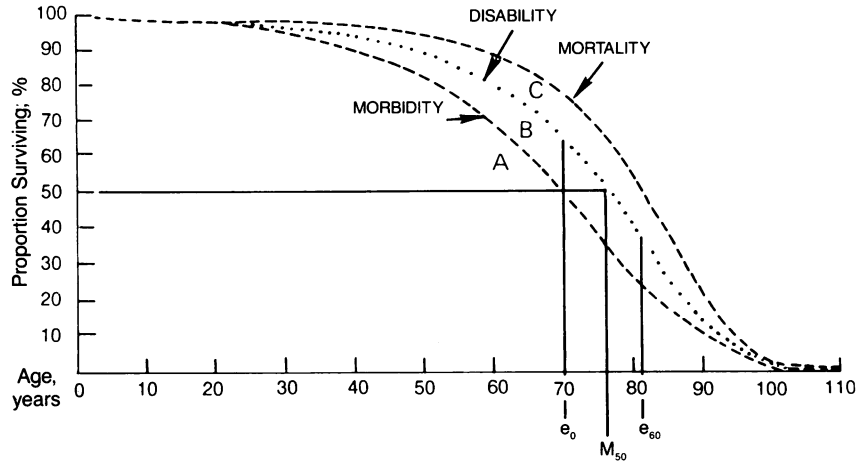

Figure 3.—The graph shows the percentage of persons surviving in relation to morbidity, disability, and mortality (from Statistics for Health Policy[6]). A full discussion of the meaning of the curves and the areas below the curves (labeled A, B, and C) is given in the text. e_0 and e_{60} are the number of years of autonomous life expected at birth and at age 60, respectively. M_{50} is the age to which 50% of women could expect to survive without loss of autonomy.

Among both white and black women younger than 65 years, bad health is concentrated among the nonemployed, nonmarried. Contrary to popular belief, women with the triple roles of worker, spouse, and mother were the most healthy in both races. At the other extreme, those women who have neither children, job, nor spouse have the worst health status. These patterns do not distinguish cause and effect; that is, healthier women might be those who are more able successfully to marry, bear children, and work outside the home; it is also possible that the lack of a job and spouse may be stressful factors that might lead to deleterious health consequences.

Population health trends reflect a complex interplay between medical and psychosocial realities. Dramatic role changes have occurred for women in the past few decades, but those role changes have not yet affected the elderly age group. Some parts of the demographic revolution are yet to come, where a dramatically increasing number of women will survive into old age with relatively good health and vigor, bringing with them the knowledge and skills of occupations and professions. In future decades, we may see equally as dramatic social role changes among elderly women as we presently see among younger women.

Much research has shown that satisfaction with one's main work role, either job or housework, is a strong predictor of good health and that overall life satisfaction is linked to a longer life.[12] That autonomy and choice of life-style are related to health in old age has long been thought and is shown in various studies of adaptation to retirement. It may be that flexible and innovative approaches to work, such as recognition by the Social Security system or other pension plans that homemaking is work, could add to the options for healthy elderly women and thus contribute to their well-being.

The Frail Elderly

While increasing life expectancy is accompanied by continued health for most people, the percentage of persons who require major medical care, nursing care, or assistance in activities of daily living increases dramatically after about age 75. In nursing homes about 75% are elderly and 60% to 70% are women. As mentioned earlier, the group at highest risk of being confined to an institution are very old women, widowed, poor, and living alone. The determinants of the need for institutional care are not simply levels of disability but also the availability of informal support systems that might allow a person to be cared for in the home.

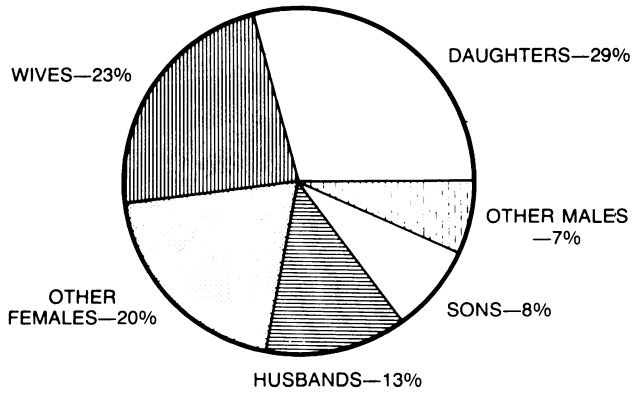

Figure 4.—The diagram shows the distribution in 1982 of informal care givers by their relationship to the elderly care recipient. The care-giving population includes primary and secondary care givers (from House Select Committee on Aging[14]).

For every elderly person in a nursing home in the US, there are about two to three times as many of exactly the same functional state who are being cared for by informal care networks, usually composed of family members.[13] It is also the case that women, primarily daughters and daughters-in-law, are the persons who provide this care, regardless of the sex or even the direct blood relation with the elderly person in need (Figure 4).[14] With increasing longevity, this fact carries with it some serious problems. It is no longer uncommon for a 90-year-old woman to be cared for by her 70-year-old daughter or daughter-in-law. There are also many instances of women in their 90s caring for a 70-year-old daughter who may be immobilized by stroke or hip fracture. Elderly people living alone are at greater risk of going into an institution than similarly disabled people of the same age who are living with one or more other persons.[15]

The Future

Demographic trends will influence the availability of informal sources of care for elderly women. Future cohorts of older people in this country will be larger than the present cohort, and thus the "burden" of caring for frail old people will increase. As the population ages, potential informal care givers, such as spouses or adult children, will be older themselves and will possibly be less able to care for elderly relatives.

In addition, families are having fewer children and middle-aged women are more often working. This will leave fewer women at home to provide care. It already accounts in part for the rapid increase in the number of elderly women living alone and the increased need for institutional long-term care.

Prevention

If the chronic disabling conditions of old age could be prevented or delayed and if the human life span is fixed at approximately 85 to 100 years, we could look forward to the phenomenon of the compression of morbidity. In that theoretic context, it is predicted that improvements in life-style will both delay the onset of disability and reduce the prevalence of morbidity from chronic disease—thus, a compression of morbidity at older ages. People would then die at the end of a natural life span without first experiencing a long period of decline.[16]

Existing data suggest that two of these premises are incorrect. Clearly the major causes of disability and morbidity in very old age are chronic degenerative neurologic diseases, such as Alzheimer's and Parkinson's diseases, and chronic musculoskeletal illnesses such as osteoarthritis and osteoporosis with fractures. Currently, little is known about either the etiology or methods of preventing any of these diseases. Therefore, the hope that life-style changes would influence these diseases is not based on sound data.

In addition, it is possible that life span itself may be increasing, in addition to life expectancy.[17] Life span is defined as the biologic natural limit to human life, while life expectancy is the average number of years lived by a cohort. If life span itself is increasing, albeit at a slower pace than life expectancy, then longer periods of disability would be predicted as people live longer.

Thus, increasing life expectancy will probably lead to a virtual "pandemic" of chronic diseases and states of dependency.[18] The increases in the prevalence of chronic condi-

tions due to advances in medical technology have been the failures of success. The number of very old people is increasing rapidly, and the average period of diminished vigor will probably also increase. Chronic disease will probably occupy a larger proportion of the life span, and the needs for medical care in later life are likely to increase substantially.

Prevention—A Model

One of these chronic disabling diseases, osteoporosis, is beginning to be clarified by research that focuses on preventing its most disabling and life-threatening consequences, namely bone fracture and particularly hip fracture. In 1980, about 200,000 people, whose median age was 79, suffered hip fractures, and increased incidence is correlated directly with increased longevity. Recent studies on osteoporosis show that moderate exercise can delay age-related bone loss, even in older women, especially when combined with estrogen replacement treatment. Brody has shown that if hip fracture itself could be delayed only five years overall, the incidence of hip fracture would decrease by 50%.[19]

This is an important observation for two reasons. First, it reflects the fact that elderly people have many chronic illnesses, and by "preventing" or "delaying" death from one cause, a person is exposed to the risk of death from another cause, such as heart disease or cancer. Second, it suggests that one need not entirely prevent the underlying disorder from occurring, but, rather, through training and environmental manipulation, as well as meticulous medical care and the avoidance of unnecessary medications, it is possible to prevent the fall that often results in hip fracture—the fall that results in entry into an institution and being unable ever to walk again. Thus, to delay the onset of the first hip fracture by five years would effectively prevent fractures, for it would allow many people to die of other causes without succumbing first to the long-term disability of hip fracture. This same principle might apply to other disabling diseases, such as Alzheimer's disease or osteoarthritis, if we knew how to delay their onset.

Conclusion

What can we anticipate in the future? Barring unforeseen disasters such as environmental catastrophes or major wars, we can expect a continuation of the increase in life expectancy in this country. While we do not understand everything about its cause, we have no reason to believe that the greater longevity of women will change. If current trends in cardiovascular mortality continue, it is possible that men will live longer and catch up somewhat to women. Morbidity will be delayed, but probably not significantly "compressed."

Extending life expectancy will probably result in ever larger numbers of both economically and physically able very old people and chronically ill, dependent persons. Two major fears about such long lives relate to the health and economic status of old people. There are considerable differences among persons in lifetime economic and work experiences, level of educational attainment, living arrangements, health practices, and health care, all of which have implications for the well-being of persons when they reach old age and for the cost to society. Catastrophic illnesses and illnesses of long duration are a significant economic threat, even to the aged persons who have good economic resources, because old persons have little opportunity to replace their assets once they are spent.

Given our current medical knowledge, we can expect to see an increasing number and proportion of older women suffering from the chronic, nonlethal, disabling diseases of old age, primarily degenerative neurologic and musculoskeletal disorders. This will lead to the need for a tripling of our long-term care capability, including institutional care and community-based resources for home care.[20] A critically important need is a shift in medical training to a greater emphasis on long-term care.

There are many important areas of uncertainty in these forecasts. We hope to see major advances in understanding the etiology of diseases such as Alzheimer's disease and osteoarthritis. It is entirely possible that new knowledge could lead to effective preventive or ameliorating treatments. Further advances in molecular biology may lead to more specific and effective treatments for cancer, thus diminishing or even eliminating the disability and mortality caused by breast cancer, lung cancer, leukemia, colorectal cancer, and the other major malignant disorders of old age.

In this social context, we can hope that society will find a way to maintain a relatively affluent economy and to offer equal access and equal payment to women and men of all ages, based on their qualifications and capabilities rather than on their age or sex. If these kinds of advances were to occur, we might see a very different society in the year 2020 or 2030. There might be more older people, particularly women, in major positions of political and business leadership. There might be a greater social commitment to both long-term care insurance and regulations that protect families from exhausting their personal and financial resources in caring for their frail older members. Women could then help support their children's college educations, be productive in the economy, and still be assured that their frail elderly relatives are receiving good care.

There is no doubt that there are many problems and challenges that lie ahead. There is also no doubt that the aging of our society is the result of the success of our civilization. An increasing number of older people should be seen not only as a burden but as a challenge for a humane, affluent, and successful society. It will take foresight, courage, and vision, however, to turn this challenge into positive realities and, for example, to avoid discriminatory policies in which people are denied health care simply because of their advanced age.[21]

Whatever social, political, and biomedical realities accompany the next demographic transition, one thing is clear: the problems of the aging society will rest increasingly on women. The solutions, too, may depend on the experience and expertise of its women.

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* * *

Intensive Care

Dorothy smells sweet in her dying.
Her infection, pseudomonas, consumes her
like a crumbling stick of honey incense.

Sparked from rough coals of cancer dug
from her belly, the smouldering spreads,
burns in sheltered corners in her lungs.

We force air into Dorothy through a hole
in her neck—another surgery, another
wound that will not heal.

We forget a simple rule:
don't chase cancer
with a knife.

*

Dorothy, I never knew you whole.
Comatose from the first day, you have lain
these weeks with eyes turned in on

who can tell? Pain,
or memory, or the bright
glow of your dying?

Maybe the sweet combustion
of bacterial growth is a scent
that centers you in that old, deep brain.

If I knuckled your chest where the bones
show thin, you would only flex
your wrists in a limp salute,

or your jaw would quiver open-close-
open-close, the way wild animals grimace
for the taste of prey.

*

Your men are gone.
Father, husband, sons who waltzed with you
have faded into the wallpaper roses.

There is no one to lead you in this last
number. We are two girls in white left
to learn the final steps together.

It has always come down to this:

women teaching women how to live.
Dorothy, my grandmother, my child,
I feel too young for this mothering.

Gloves off, I take your hands
burning with infectious fire
that beats in your blood,

hot sparks pumped round and
round by the tired iamb
of your heart.

*

It is late afternoon—time enough for tea,
and little biscuits, and crumbs that fall
to the pink napkin in your lap.

Flowers bloom in corners sheltered
from the swish of passing dancers.
Musicians blow notes under the swaying palms.

Feel the beat, Dorothy, one-two-
one-two, like wild animals
pacing in a cage.

A sweetheart waits in the knife-edge
shadows of the potted palms,
and when the music stops—

when *the music stops, Dorothy—*
he will ask you
for the next dance.

*

The air folds into you
like layers of perfumed
tissue paper.

Here is a red rose
to burn in the ash
of your hair.

I tell you, Dorothy,
it is time
the music stopped.

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